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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/743,970	12/23/2003	Gino Tanghe	920522-95345	9404
23644 7590 02/04/2011 BARNES & THORNBURG LLP P.O. Box 2786 CHICAGO, IL 60690-2786			EXAMINER HOLTON, STEVEN E	
			ART UNIT 2629	PAPER NUMBER
			NOTIFICATION DATE 02/04/2011	DELIVERY MODE ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

Patent-ch@btlaw.com

### Office Action Summary

**Application No.**

10/743,970

**Applicant(s)**

TANGHE ET AL.

**Examiner**

Steven E. Holton

**Art Unit**

2629

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 16 November 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-18, 20 and 23-26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-18, 20 and 23-26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-945)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

1. This Office Action is made in response to applicant's arguments filed on 11/16/2010. Claims 1-18, 20, and, 23-26 are currently pending in the application. An action follows below:

#### ***Response to Arguments***

2. Applicant's arguments, see pages 2 and 3, filed 11/16/2010, with respect to the rejection(s) of claim(s) 1, 4, 7, 8, and 17 under 35 USC 102 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of combination of prior art already of record.

Regarding the Applicant's arguments, the Examiner agrees with the argument that the Greene reference is lacking support for the requirement of passing the first subdivision target values to a next higher control level. Greene does not pass target values between levels of correction for making adjustments.

Regarding the arguments related to claim 24, the Examiner does not find the arguments persuasive. Upon review of claim 24, the Examiner finds that the limitations of claim 24 and claim 1 differ from each other. Most importantly, the control unit of claim 24 lacks description of 'passing first subdivision target values to a next higher level'. Claim 24 only requires that the setting of the entire emissive display take into account the target values used to set the subdivisions. The system described by Greene first performs setting of subdivisions of the display to target values so that each

subdivision has matched operation. Then, Greene performs a further matching to remove any differences between subdivisions within the overall display. The further correction is performed on the already corrected subdivisions. This means that the previously used target values and corrections are taken into account as the starting point for determining any further display-wide corrections will be applied. If the subdivision target values and corrections were not taken into account when making the global level corrections, during normal operation the system of Greene would apply both the subdivision and global corrections at the same time and the two corrections would interfere and produce a display lacking globally matched colors. Therefore, the Examiner maintains the rejection of claim 24 under 35 USC 102 in view of Greene.

Regarding the arguments about a lack of a target value, the Examiner respectfully disagrees. While Greene does not explicitly state a target value, Greene is concerned with the matching of the displayed color and brightness of different display areas in a tiled display. It is well known in the art of display devices that color and brightness data in the form of image data is stored as values. The different standards for saving the color and brightness values include RGB, Yuv, xyY, XYZ, and other types of color spaces. These standard value sets are used to encode image data for transmission to display devices and are then decoded by a display device to reproduce the image. The target values referred to by the Applicant (page 3 of the arguments) are described in "x, y, Y coordinates" which are one of the standard color space encoding schemes. Greene provides correction to color and brightness of image data to achieve a specific end value. The uncorrected image data is inherently stored as some sort of

value, the corrections performed on the image data by Greene will be performed as some sort of mathematical function resulting in corrected image data values. Greene expressly corrects the data used for all pixels within the tiled display so that the displayed images have matching color and brightness attributes. This means that all elements of the displays are shifted to a target value (the matched output values).

The performance of Greene to cause all of the elements within a tiled display to operated at the same color and brightness levels is an act of optimization. Optimize is defined as "to make as perfect, effective, or functional as possible (Miriam Webster)". Greene is applying corrections to make the outputs of the pixels as equally and perfectly matched as possible. This is an optimization of the operation of the display to produce a display that has as close to perfectly equal color output for all pixels within the display.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claim 24 is rejected under 35 U.S.C. 102(b) as being anticipated by Greene et al. (USPN: 6,292,157), hereinafter Greene.

Regarding claim 24, Greene discloses a tiled large screen emissive display (Figs. 3, 4, 5, and 6, element 20; col. 2, lines 30-42 state that LCD is used as a generic term to describe flat-panel displays including emissive and transmissive displays). Greene

discloses the tiled display having multiple subdivisions (Figs. 3-6, elements 22) and each of these display tiles possess emissive devices in the form of individual pixels (col. 2, lines 36-38). Greene discloses a method of operating the device of setting the operating parameters of the emissive devices to be optimized to produce a target value of equivalent color across the entire display tile (col. 3, lines 4-16; 31-42; and 60-65). The target value is the value that allows the display to operate having "total color purity throughout a tiled LCD display (col. 4, lines 3-4)" and this total color purity value would be some sort of encoding of values within a color space such as RGB, Yuv, xyY, or other known color space encoding standard. First a display device is manufactured and the emissive devices of the display are set to meet the target value for the individual display (col. 3, lines 4-16; 31-42; and 60-65; col. 5, lines 39-46; col. 6; lines 1-36). Then, Greene optimizes the entire tiled display by producing a set of parameters that are transmitted to each of the first subdivisions (display panels) to produce a tiled display that provides a standard image for the entire tiled display taking into account the individual characteristics of each of the displays (col. 5, lines 54-60; col. 6, lines 1-52). The control of the parameters is performed by the controller circuitry (Figs. 2-5, element 12 and sometimes element 26). So, Greene discloses forming a tiled display device having multiple tiles each having individual emissive devices, and setting the operational parameters of the display devices of each of the emissive devices to achieve a tiled display having uniform color characteristics for the entire display.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Greene.

Regarding claim 25, as discussed above Greene discloses a method of setting the operation parameters of a display device for a tiled display to operate the display at a target value. Greene also discloses using two levels of parameter balancing with a different level of consideration (col. 6, lines 33-36).

At the time of invention it would have been logically obvious to one of ordinary skill in the art that the method of matching groups of tiles disclosed by Greene could be expanded to include further groups of tiles. The rationale would be to scale a method of correction of multiple display elements for larger and larger groups of display elements. It would be logically obvious that two tiled displays having multiple display tiles could be brought together to form a larger tiled display and recursively, the larger tiled display could be matched with another larger tiled display to produce even larger display devices. In such cases, the operational parameter settings for the smaller tiled display groups would then be further adjusted to match the parameters of other smaller tiled display groups to produce parameters for the entire larger tiled display. The further adjustments to the smaller tiled displays would allow for color uniformity across the

combined display and produce a larger display having acceptable color uniformity and visual output. Thus, it would have been obvious to extend the method of matching multiple display devices as described by Greene to match multiple groups of tiles to read on the limitations of claim 25.

Claims 1-10, 17, 18, 20, 23, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Greene in view of Someya et al. (USPN: 5936257), hereinafter Someya.

Regarding claim 1, Greene discloses a tiled large screen emissive display (Figs. 3, 4, 5, and 6, element 20; col. 2, lines 30-42 state that LCD is used as a generic term to describe flat-panel displays including emissive and transmissive displays). Greene discloses the tiled display having multiple subdivisions (Figs. 3-6, elements 22) and each of these display tiles possess emissive devices in the form of individual pixels (col. 2, lines 36-38). Greene discloses a method of operating the device of setting the operating parameters of the emissive devices to be optimized to produce a target value of equivalent color across the entire display tile (col. 3, lines 4-16; 31-42; and 60-65). The target value is the value that allows the display to operate having "total color purity throughout a tiled LCD display (col. 4, lines 3-4). First a display device is manufactured and the emissive devices of each tile are set to meet the target value for the individual tile (col. 3, lines 4-16; 31-42; and 60-65; col. 5, lines 39-46; col. 6; lines 1-36). Then, Greene optimizes the entire tiled display by producing a set of parameters that are transmitted to each of the first subdivisions to produce a display that provides a

standard image for the entire tiled display taking into account the individual characteristics of each of the displays (col. 5, lines 54-60; col. 6, lines 1-52). The control of the parameters is performed by the controller circuitry (Figs. 2-5, element 12 and sometimes element 26).

However, Greene does not expressly disclose passing the first subdivision target values to the next higher control level.

Someya discloses a multiple level method of matching the performance of displays within a tiled display. Someya discloses a system that first performs color correction for individual displays and stores results in a data converter/LUT associated with a single display (col. 4, line 64 - col. 5, line 5 and co. 5, lines 18-28). After the corrections are made for each of the individual displays of the tiled display, Someya discloses performing corrections to match each of the displays to each other using the previously calculated values and adjusting those values in the memory locations using the computing system (col. 5, lines 28- 37). Thus, after the first corrections are completed, Someya passes the correction values to the next level of processing for a second round of processing to match the different sets of correction values.

At the time of invention it would have been obvious to modify the teachings of Greene with the teachings of Someya. The system of Greene could be modified so that instead of merely calculating correction values for one level and then calculating values of a higher control level, the system of Greene could use a set of calculated values for a single display set of corrections to be passed to a higher control level to be part of calculations to set higher level values for an entire tiled display. The rationale would be

to apply a known technique of hierarchical calculation as taught by Someya to the display system of Greene with expected results. Thus, it would have been obvious to combine the teachings of Greene and Someya to produce the method of controlling a display as described in claim 1.

Regarding claims 2 and 3, as discussed above Greene and Someya discloses a method of setting the operation parameters of a display device for a tiled display to operate the display at a target value. Greene also discloses using two levels of parameter balancing with a different level of consideration (col. 6, lines 33-36).

At the time of invention it would have been logically obvious to one of ordinary skill in the art that the method of matching groups of tiles disclosed by Greene and Someya could be expanded to include further groups of tiles. The rationale would be to scale a method of correction of multiple display elements for larger and larger groups of display elements. It would be logically obvious that two tiled displays having multiple display tiles could be brought together to form a larger tiled display and recursively, the larger tiled display could be matched with another larger tiled display to produce even larger display devices. In such cases, the operational parameter settings for the smaller tiled display groups would then be further adjusted to match the parameters of other smaller tiled display groups to produce parameters for the entire larger tiled display. The further adjustments to the smaller tiled displays would allow for color uniformity across the combined display and produce a larger display having acceptable color uniformity and visual output. Thus, it would have been obvious to extend the method of

matching multiple display devices as described by Greene and Someya to match multiple groups of tiles to read on the limitations of claims 2 and 3.

Regarding claim 4, Greene discloses the first subdivision is an emissive tile (Fig. 3, element 22; col. 2, lines 30-42).

Regarding claims 5 and 6, by grouping multiple emissive tiles together, Greene and Someya would produce a display tile and by grouping multiple display tiles together Greene and Someya would produce a display supertile. It would be logically obvious that groups of tiles could be combined to form larger and larger groups of tiles and to finally produce a desired tiled display device made up of groups of groups of tiles.

Regarding claims 7 and 8, Greene discloses setting the elements of the tiled display to operate at the same target output level (Fig. 9b, element 92 shows the corrected output curve of multiple tiles each having multiple emissive devices; the displays are shown to have essentially the same output for all of the emissive devices so the Examiner reads this as being within a .8% performance of the target value; col. 3, lines 38-42 notes that changes between levels from one tile to another are to be kept to about 1% of performance of each other which; the Examiner interprets 0.8% as being about 1%).

Regarding claims 9 and 10, Greene discloses setting the elements of the tiled display to operate at the same target output level (Fig. 9b, element 92 shows the corrected output curve of multiple tiles each having multiple emissive devices; the displays are shown to have essentially the same output for all of the emissive devices so the Examiner reads this as being within a .8% performance of the target value; col. 3,

lines 38-42 notes that changes between levels from one tile to another are to be kept to about 1% of performance of each other which; the Examiner interprets 0.8% as being about 1%). It would be logically obvious to set multiple groups of displays to be within 1% of each other so that the large tiled display having multiple groups of tiles would continue to have acceptable performance as a display device.

Regarding claim 17, Greene discloses adjusting control parameters that were previously stored (col. 6, lines 9-10).

Regarding claims 18 and 20, Greene discloses calibrating the operating parameters of the display devices to calibrate the color purity of the display devices (col. 5, lines 42-46) and the use of electronic systems to perform the balancing of parameters (col. 6, lines 33-36). Neither Greene nor Someya discloses using an adaptive algorithm, but it would be obvious to one skilled in the art as useful programming and would be a matter of design choice based on the speed of algorithms available vs. the amount of computer processing power and memory available for the entire system.

Regarding claims 23 and 26, Greene discloses the use of electronic systems and a controller circuit for performing the balancing of parameters (col. 6, lines 6-10 and 33-36). At the time of invention it would have been obvious to one of ordinary skill in the art that the electronic systems or circuit could be a processor running a program and the program could be stored on a computer readable medium or transmitted to the system over a communications network. The use of computer readable mediums and telecommunications networks is well known in the art of electronic systems and it would have been obvious to use a computer readable medium or communication system to

transmit methods of operation of the electronic device to the tiled display system of Greene and Someya.

5. Claims 11-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Greene in view of Someya and in further view of Miller et al. (USPN: 7184067), hereinafter Miller.

Regarding claim 11, Greene and Someya discloses all of the limitations except, "wherein determining any or more of the first subdivision target value, second subdivision target value, the further subdivision target value and/or emissive display target value, an environmental parameter is take into account."

Miller discloses an electroluminescent display device (Fig. 3, element 28) where the operating parameters of the display device are modified by measuring an environmental parameter of the conditions outside of the display device (col. 8, lines 26-43).

At the time of invention it would have been obvious to one or ordinary skill in the art to combine the teachings of Greene and Someya and Miller to produce a tiled display device with correction for environmental parameters. It would have been obvious to combine the tiled electroluminescent display of Greene with the ambient light measurement system described by Miller. The motivation would be to adjust the brightness of the display device based on the ambient light to improve the power consumption and lifespan of an organic electroluminescent display device (Miller, col. 10, lines 9-12). Thus, it would have been obvious to combine the teachings of Greene,

Someya and Miller to produce a method of operating a tiled display with environmental measurement as described in claim 11.

Regarding claim 12, Miller discloses measuring the temperature of a display device for modification of the output of the display device (col. 10, lines 20-22).

Regarding claim 13, Miller discloses that the temperature sensor can be inside the display device and outside the display device (col. 10, lines 20-22). A temperature sensor placed near a display device can only measure the ambient temperature surrounding the display device which is affected by the display device. Thus, by measuring the temperature outside of the display device the temperature of the display device can be estimated based on the measured ambient temperature.

Regarding claim 14, Miller discloses measuring the ambient illumination (col. 8, lines 26-43).

6. Claims 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Greene in view of Someya and in further view of of Cok et al. (USPN: 7161566), hereinafter Cok.

Regarding claims 15 and 16, Greene and Someya discloses all of the limitations except using an operating parameters comprising the age, or total ON time of any of the subdivisions of the emissive devices within the display device.

Cok discloses a method of adjusting and correcting the output of an electroluminescent display device based on the measurement of the age of the display device (abstract; col. 7, lines 18-26).

At the time of invention it would have been obvious to one of ordinary skill in the art to combine the teachings of Greene and Someya and Cok. The calibration method of the Greene and Someya system could be combined with calibration method dealing with aging of emissive devices of Cok. The rationale would be that aging of emissive elements or other operation parameters known to affect the display devices could be taken into consideration as part of the calibration of the display device. Thus, it would have been obvious to combine the teachings of Greene, Someya and Cok to produce a method and device as described in claims 15 and 16.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven E. Holton whose telephone number is (571)272-7903. The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bipin Shalwala can be reached on (571) 272-7681. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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January 29, 2011